

Daikin – 100 years and beyond

Intermodal conference – Rotterdam 2024



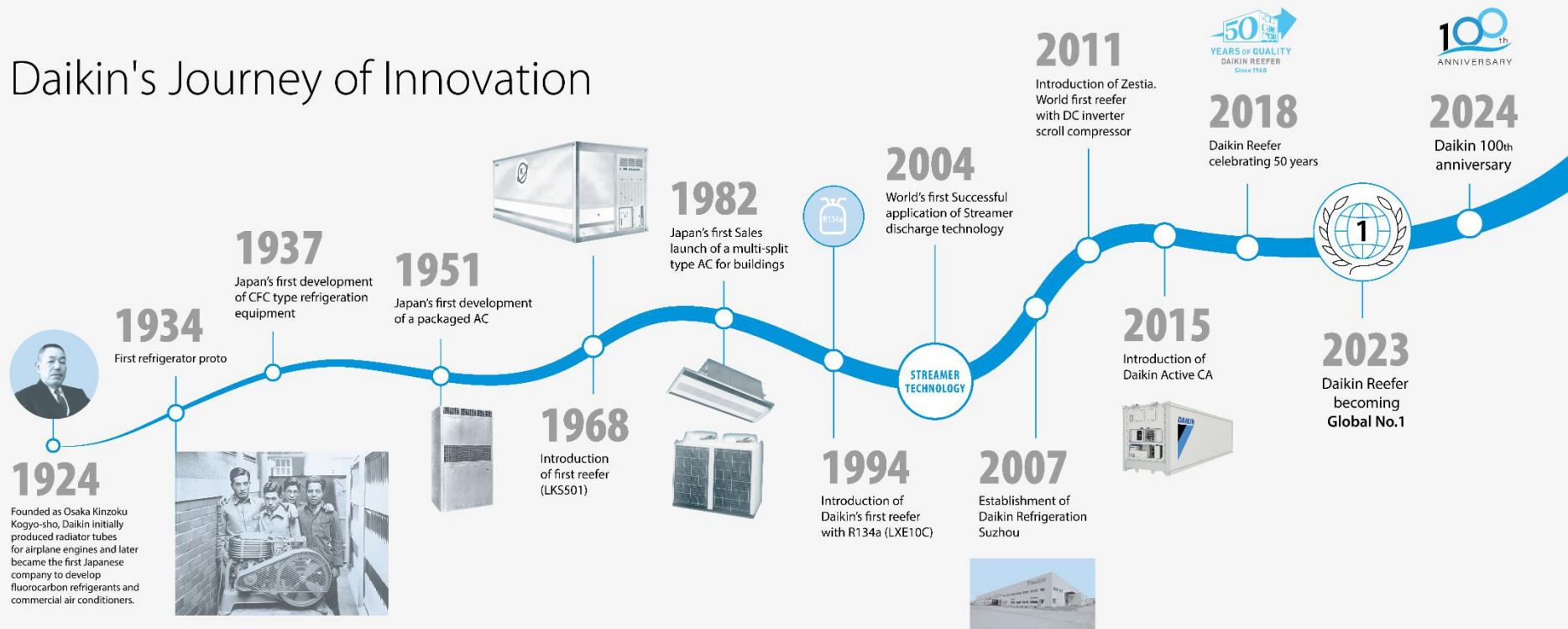
LOGISTICS



RETAIL



Daikin's Journey of Innovation



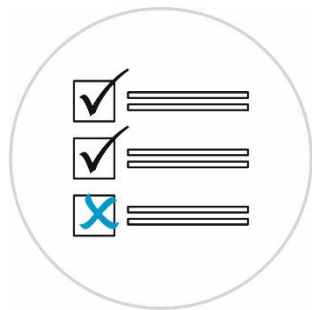
Environment

Telematics

Refrigerant

Controlled Atmosphere

Reliability



Daikin environmental vision 2050

We will provide safe, healthy air environments while striving to reduce greenhouse gas emissions to net zero.



Open innovation
IoT and AI



Open innovation
IoT and AI



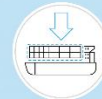
Daikin Reefer aims to achieve net zero GHG by 2030



Power saving



Low GWP Refrigerant



From air to sea
modal shift



Telematics



Production plant
Carbon Neutrality

| | CO2 tons | Remarks |
|--------------------|----------|--|
| Total CO2 emission | 64.38 | |
| Procurement | 6.52 | |
| Production | 0.21 | |
| Delivery | 0.02 | |
| Operation | 53.06 | 51.11 from power consumption 1.95 from refrigerant leakage |
| Disposal | 4.57 | 4.54 from improper refrigerant treatment 0.03 from disposal |

Environmental approach



Disassemble (After refrigerant removal)



Iron
93kg



Copper
2kg



Cable
7kg



Motors
36kg



Refrigerant
5.675kg

⇒ Refrigerant
disposal



Mixed metal
204kg

⇒ After press work,
2nd waste treatment



Compressor
41kg

⇒ 2nd waste treatment



Heat exchanger
53kg

Most important – treatment of refrigerant (big impact on GHG emissions)
Disposal itself, limited impact (considering dismantel locations etc.)
Circular economy

What Daikin can do for **your carbon neutral target?**

1. Energy efficient product
Continuous enhancements will reduce **30% CO2 emission**
2. Carbon neutral factory
Daikin factory will be **Carbon neutral on year 2030.**
3. Low GWP refrigerant
Machinery with 1234yf retrofitted.
Low CO2 impact by low GWP refrigerant.

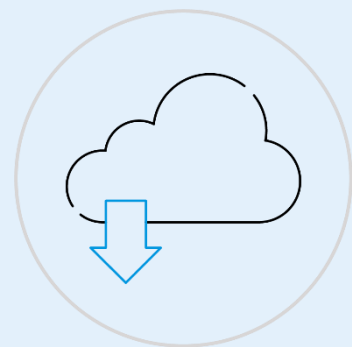
And... CA technology would contribute

4. Modal shift from Air to Sea

Contributions that exceed emissions

Environmental approach

| | 2024 | | 2030 | Remarks |
|--------------------|-------|---|-------|--|
| Total CO2 emission | 64.38 | → | 0.00 | |
| Procurement | 6.52 | → | 3.91 | 40% reduction by Source from Greener supplier. Material recycle |
| Production | 0.21 | → | 0.00 | |
| Delivery | 0.02 | → | 0.02 | |
| Operation | 53.06 | → | 37.14 | 30% power reduction 0 from gas leakage |
| Disposal | 4.57 | → | 0.03 | 0 from improper refrigerant treatment 0.03 from disposal |
| Offset | 0.00 | → | 41.1 | Food loss reduction Modal shift from Air to Sea |



Refrigerants

Daikin's View:
Evaluation Index of Refrigerant Selection
(common for all application)



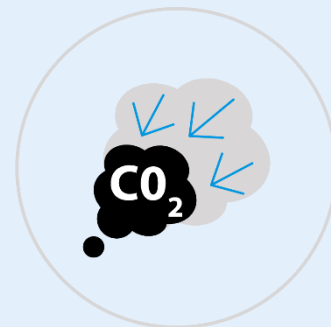
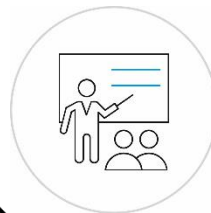
R134a
R513a
R1234yf

Zestia
for 2 refrigerants

Zestia
for 3 refrigerants

R744

R744 Model



Telematics

DAIKIN'S TELEMATICS SOLUTION
FOR REEFER MANAGEMENT

Direction of value provided by Telematics



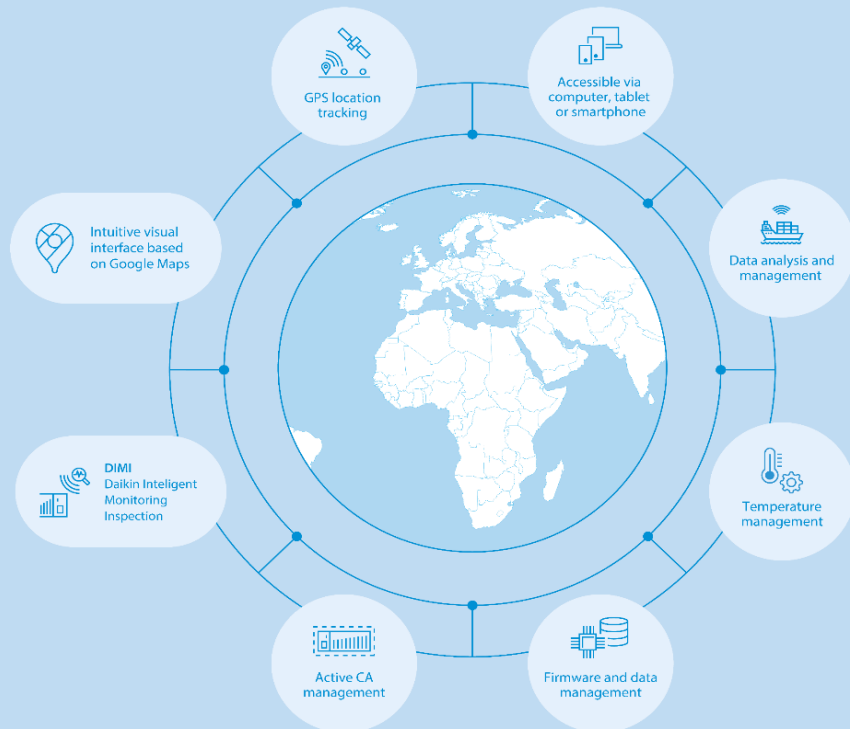
Ensure safety
transportation



Reduce operation cost



Environmental solution



Environmental approach



Reefer Health Check

● Health ● Caution ● Serious

28

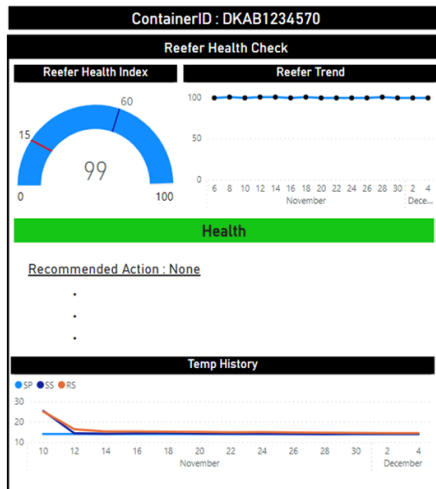
Reefer Total



➤ Range



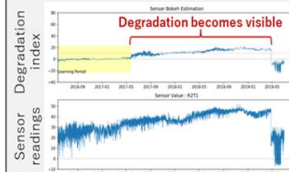
| ContainerID | Reefer Category | Reefer Health | Reefer Description | CA Category | CA Health | CA Description |
|-------------|-----------------|---------------|--------------------|---------------|-----------|----------------|
| DKAB1234567 | Health | ● | 89 | None | | |
| DKAB1234568 | Health | ● | 100 | None | | |
| DKAB1234569 | Caution | ● | 55 | Recommend PTI | | |
| DKAB1234570 | Health | ● | 99 | None | Health ● | 89 |
| DKAB1234571 | Health | ● | 89 | None | | |
| DKAB1234572 | Health | ● | 97 | None | | |
| DKAB1234573 | Health | ● | 100 | None | | |
| DKAB1234574 | Health | ● | 85 | None | | |
| DKAB1234575 | Health | ● | 82 | None | Health ● | 100 |
| DKAB1234576 | Health | ● | 95 | None | | |
| DKAB1234577 | Caution | ● | 53 | Recommend PTI | | |
| DKAB1234578 | Health | ● | 91 | None | | |
| DKAB1234579 | Health | ● | 89 | None | | |
| DKAB1234580 | Health | ● | 100 | None | | |
| DKAB1234581 | Caution | ● | 55 | Recommend PTI | | |
| DKAB1234582 | Health | ● | 97 | None | | |
| DKAB1234583 | Health | ● | 99 | None | | |
| DKAB1234584 | Health | ● | 97 | None | | |
| DKAB1234585 | Health | ● | 100 | None | | |
| DKAB1234586 | Health | ● | 76 | None | | |
| DKAB1234587 | Serious | ● | 14 | Carry out PTI | | |
| DKAB1234588 | Health | ● | 87 | None | | |
| DKAB1234589 | Health | ● | 98 | None | Health ● | 99 |
| DKAB1234590 | Caution | ● | 53 | Recommend PTI | | |
| DKAB1234591 | Health | ● | 89 | None | | |
| DKAB1234592 | Health | ● | 99 | None | | |
| DKAB1234593 | Caution | ● | 55 | Recommend PTI | | |
| DKAB1234594 | Health | ● | 89 | None | Health ● | 95 |



Ongoing development

1. Sensor degradation Detection

Target: each sensor reading



To help engineers identify root cause

2. Compressor degradation Detection

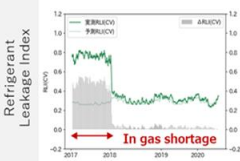
Target: compressor current



To prevent fatal damage to the unit

3. Refrigerant Leakage Detection

Target: refrigerant leakage index



To comply with environmental regulation

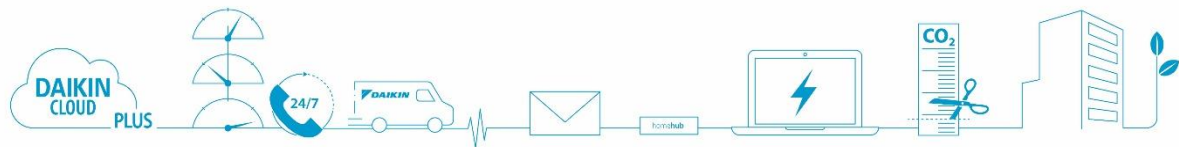
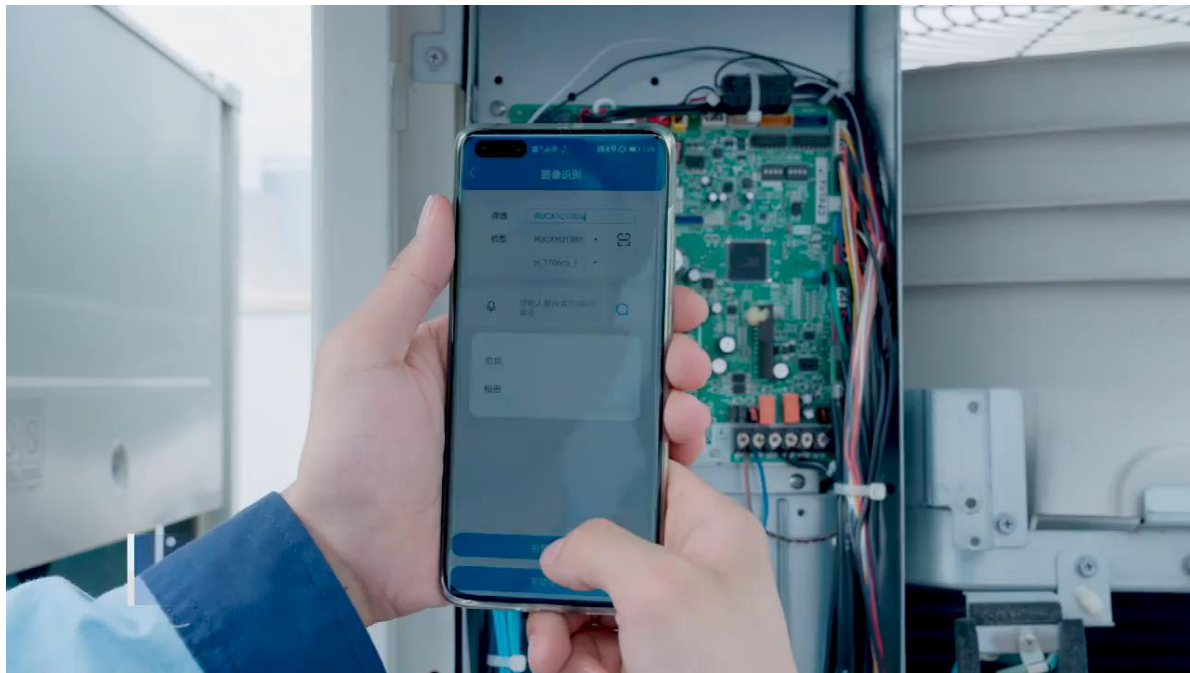
4. Performance Degradation Detection

Target: overall performance of unit



To comply with energy code

Parts identification

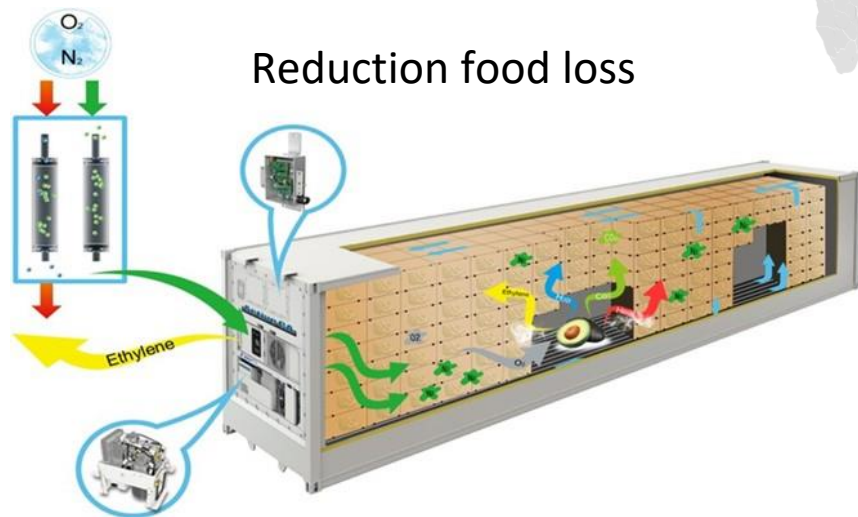


Daikin Active CA

Established CA system since 2015

Fine-tuning for new cargo

Freshness control



Modal shift from Air to Sea



Daikin Active CA contribution

Daikin Reefer
aims to achieve
net zero GHG
by 2030



Power saving



Low GWP Refrigerant



From air to sea
modal shift



Telematics



Production plant
Carbon Neutrality



Reliability

- Hot gas defrost & heating
- Automatic pumpdown
- Inverter technology
- Active CA



We create solutions which meets the next generation



Cold Chain. Integrated.



LOGISTICS



RETAIL

